



History matters: development and institutional persistence of the Habsburg Military Frontier in Croatia

MARINA TKALEC, Ph.D.*

Article**

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Marina TKALEC

The Institute of Economics, Zagreb, Department of Macroeconomics and International Economics,

Trg J. F. Kennedyja 7, 10000 Zagreb, Croatia

e-mail: mtkalec@eizg.hr

ORCID: 0000-0001-7974-9345

Abstract

In this paper we explore the effect of the long-gone Habsburg Military Frontier on modern institutions in Croatia. We use the Life in Transition Survey and geographic regression discontinuity design to identify the causal mechanism between historical institutions and attitudes towards trust and corruption. We find that the areas of the former Military Frontier are underdeveloped and poorer with worse economic performance indicators. Our results suggest that respondents living in the former Military Frontier territory have lower levels of interpersonal trust, a higher level of trust in public authorities, but also tend to bribe those institutions more often when they interact with them. We claim that the war in Yugoslavia in the 1990s is not just a confounding factor in the analysis but also a potential channel and find evidence that attitudes towards bribery can survive even harsh wars, while trust in public institutions collapses during extreme events of violence.

Keywords: development, geographic regression discontinuity, institutions, macro-economics

1 INTRODUCTION

The notion that history, previous developments and path dependency are relevant for today's socioeconomic context has recently attracted a lot of academic interest in economics. Indeed, since the pioneer work by North and Thomas (1973) and North (1981; 1990) in institutional economics, and Greif (1994; 2006) on the impact of persistence on culture and institutions in development, a series of scholars have recently further explored this research agenda, in terms both of research avenues and the employment of new empirical methods and identification strategies. Using the latest econometric techniques, Acemoglu, Johnson and Robinson (2001) show how the institutions of early European settlers shape economic performance today, Glaeser et al. (2004) find that growth and human capital accumulation improve political institutions, Nunn (2008) shows a negative causal effect from Africa's slave trades on current economic performance, while Glaeser and Shleifer (2002) argue that the historical initial level of coercion risk explains the different legal origins and legal systems that shape modern socioeconomic outcomes. This type of research has, rightfully, elevated economics as a discipline into a multidisciplinary, multidimensional high impact field, and the natural experiments they use have become a state-of-the-art tool applied to explain what causes growth.

In this paper we use a (quasi) natural experiment – the geographic position of the Habsburg Military Frontier in Croatia – to identify the causal relationship between historical institutions and the attitudes towards trust and corruption of households in modern-day Croatia. We show that history matters, that institutions are persistent and that these deeper institutional relationships are important, both for policy-making and for reform design. We argue that civic capital, i.e. trust, could be one of the causal mechanisms that is usually absent from standard macroeconomic literature. While these types of research designs are common in applied microeconomics, they are less frequent in macroeconomic research, especially in Croatia.

Therefore, by using a natural experiment approach that yields intriguing results, we believe that we provide substantial insights into the functioning and development of the modern Croatian economy and significantly contribute to the advancement of methodological approaches in macroeconomic research.

Becker et al. (2016) claim that trust in institutions and corruption are the channels through which long-gone Habsburg political and institutional legacy affects modern day Europe. Building on their work we underline the fact that the former Habsburg-Ottoman border, along most of its length, was actually only the border between the Ottoman Empire and the Habsburg military cordon known as the Military Frontier. The Frontier, which existed for more than 350 years, and which was disbanded almost 150 years ago, was a militaristic establishment ruled from Vienna the purpose of which was to stop the Ottomans from making further inroads into Europe. This historic episode split the population into two parts, which lived under very different economic and political systems for a long period of time. It can be argued that the separation was exogenous to different factors that can explain existing differences in a number of observable modern-day outcomes. In that case, the assignment of households to the treatment can be taken as random, as in an experiment. The former border cut through parts of present-day Croatia, Serbia, Romania and Hungary. This exogenous variation defined around the border enables us to use regression discontinuity design (RDD) to study within-country variation and look at effects of the Military Frontier on modern beliefs and attitudes.

Although the two parts of Croatia are comparable in most demographic outcomes, we find significant differences in activity rates and economic status. The indicators are worse for the former Military Frontier and reveal that these areas are underdeveloped, poorer, and have higher unemployment rates and worse economic performance indicators. In order to explain the observed differences in development, we use three waves of the Life in Transition Survey (LiTS), fixed effects and geographic RDD to estimate ordered logit models since the responses we measure are categorical variables. Our results suggest that respondents living in the former Military Frontier territory have a higher level of trust in public authorities, but also tend to bribe those institutions more often when they interact with them. We also find that affiliation with the Military Frontier has a statistically significant negative effect on interpersonal trust. It seems that an extreme institution-building case study, such as the Military Frontier, did not only instill trust in its public institutions, but that it negatively affected trust among people.

In the following section we explain natural experiments, review the literature on natural experiments in macroeconomics, and argue the challenges and advantages of detecting causality in macroeconomics. We explain the regression discontinuity design and our overall empirical approach together with the data in section IV, after an overview of the history of the Military Frontier. Section V presents our empirical results, as well as a number of robustness checks and falsification tests.

In Section VI we tackle the most obvious confounding element and a potential channel in our analysis, that of the War for Croatian Independence and the establishment of the Republic of Serbian Krajina in the 1990s, which partially overlapped with the territory of the former Military Frontier. Finally, section VII concludes with a discussion of the implications of our findings for modern east-to-west migrations and with it associated European policies.

2 NATURAL EXPERIMENTS IN MACROECONOMICS

Detecting causality in macroeconomics is a highly debated topic in empirical research, as the direction of causality is often unclear and the exact channels are indistinguishable, leading to lack of credible identification and poor policy advice (Fuchs-Schündeln and Hassan, 2016). Due to the difficulty of the task at hand, most of the work done in empirical macroeconomics relies on matching conditional correlations and finding highly-sophisticated ways to improve the fit of econometric models. Unlike natural and some social scientists, macroeconomists traditionally do not use experiments to detect causality, as neither field nor laboratory experiments are available to them. For obvious reasons it would be impossible to control a huge and complex system such as an economy of a country in a laboratory, while field experiments would be overly expensive and due to their inevitably vast socioeconomic impacts it is highly unlikely there would be consensus to carry them out. However, there is an alternative in the literature referred to as – natural experiments.

As Fuchs-Schündeln and Hassan (2016: 4) stated, natural experiments are “... episodes that provide observable, quasi-random variation in treatment subject to a plausible identifying assumption”. An episode can be an introduction of a new policy measure, a historical episode or a naturally-occurring event such as a flood or climate change. As opposed to a laboratory experiment, macroeconomists have to argue convincingly that the intervention or treatment they are using is comparable to an experiment; i.e. that it is randomly assigned. In order to argue randomness they have to compare the treated and the control group and show that their observable characteristics differ only in the fact that one group was treated while the other was not.

The main goal of natural experiments in macroeconomics is to identify causal mechanisms (which one cannot find in conventional macroeconomic models) in order to explain the fundamental causes of growth. Although standard macroeconomic models seemingly provide those answers, their maximum reach is to give only approximate causes of growth that typically involve capital accumulation, technology, and investment. And while they are good at pinning down the mechanisms of growth, they stop short of answering the why type of questions. The fundamental causes of growth on the other hand, would identify institutions, social structure, and civic capital as the main background players.

This paper uses a natural experiment to provide evidence of historical institutions having long-term effects on institutions, civic capital and economic outcomes. Natural experiments are fairly unexplored in Croatian economics and macroeconomics. But in another context, they show that history matters, and that historical institutions have long-lasting effects, which, if ignored, will undermine most efforts at reform. Although civic capital is a slow-moving variable, it significantly determines societies' capacity for growth leaving some with high, and others with low levels of civic capital. The Habsburg Empire is well known for its reputation of "good" institutions and it is documented that the former Habsburg territory enjoys higher levels of civic capital than that of its Ottoman neighbors. However, not all Habsburg institutions were driven to build civic capital, some were established to defend the south-east borders of the Empire. Political history and the type of military colonialism that the Habsburgs preserved in Croatia for 350 years still largely influence economic performance in Croatia, especially within the country. We find that the areas that were formerly part of the Military Frontier are poorer, have higher levels of trust in institutions, a higher tendency to bribe them, and show less trust in other people (possibly related to the ethnic population mix in the area). These results are consistent with the colonial policies of the Habsburgs who exerted highly centralized authority through its military institutions, while at the same time failing to provide adequate resources to alleviate poverty, leaving the people to resort to corruption.

The literature on natural experiments in macroeconomics so far actually detected four fundamental causes of growth, adding luck and multiple equilibria to the institutions, social structure, and civic capital referred to above (Fuchs-Schündeln and Hassan, 2016). The effect of institutions on growth is extensively studied in Acemoglu, Johnson and Robinson (2001; 2002) who use an instrumental variable approach, and in Michalopoulos and Papaioannou (2013) who rely on regression discontinuity design. This type of literature uses rather simple econometric methods, but their challenge lies in correctly and convincingly identifying that the treatment is indeed random and that the natural episode resembles an experiment. Acemoglu et al. (2003) study the effect of institutions on business cycles and find that bad macroeconomic policies are no longer correlated with macroeconomic volatility once the effect of institutions is controlled for. They claim that macroeconomic policies are just tools easily replaced by other bad tools and that they are rather symptoms of deeper institutional distortions that stand in the way of higher growth. Another strand of this literature tries to detect whether replacing bad institutions would lead to preferable outcomes. These studies look at the persistent effects of historical institutions such as colonialism (Banerjee and Iyer, 2005; Iyer, 2010), forced labor systems (Dell, 2010), and communism (Alesina and Fuchs-Schündeln, 2007).

Social structure also plays a role; for example, Acemoglu, Johnson and Robinson (2005) show that those Western European countries that had a stronger merchant class also developed property rights that lead to economic growth, a concept

known as Law Merchant (Milgrom, North and Weingast, 1990). On a similar note, in Russian regions in which the Holocaust significantly reduced the size of the middle class, political and economic outcomes were worse even decades later (Acemoglu, Hassan and Robinson, 2011). Moving away from social structure, differences in civic capital – encompassing trust, beliefs, norms, and traditions – lead a society to different outcomes. Guiso, Sapienza and Gonzales (2011:3) define civic capital as “...those persistent and shared beliefs and values that help a group overcome the free rider problem in the pursuit of socially valuable activities”. Since civic capital is intertwined with institutions, the challenge in this type of research is to separate the effects in order to claim causality. Tabellini (2010) for example finds variation in civic capital within countries that dates even centuries back in history and causes modern day differences in the level of economic development. Guiso, Sapienza and Gonzales (2016) study cities in Italy and whether they had free city status in medieval times. It turns out that a longer history of self-rule is correlated with both higher civic capital and higher levels of economic development.

Trust is probably one of the best examples of civic capital as it is a prerequisite for sales, financial and investment transactions, and contracts, particularly employment contracts. The importance of trust rises with the level of complexity in the economic system, and even if differences in trust were not so detrimental decades or centuries ago, they have certainly become so more. Algan and Cahuc (2010) isolate the effect of trust and find that higher trust among people leads to higher GDP per capita. Effects of trust go beyond growth, Guiso, Sapienza and Gonzales (2004) detect the exact mechanism that translates civic capital to economic growth. In their case they find that trust – represented by financial development and the level of sophistication of the financial system – plays a role in economic growth. The other potential channel could be that of regulation (Aghion et al., 2010), where trust and government regulation are negatively correlated, implying that lower trust increases the incidence of higher government regulation.

These papers are just one piece of the puzzle as they provide evidence of civic capital having an impact on growth. The other part is detecting factors behind differing levels of civic capital. Literature provides three possible factors: historical institutions, experiences of violence and conflict, and climate (as surveyed in Fuchs-Schündeln and Hassan, 2016). Besides Tabellini (2010) and Guiso, Sapienza and Gonzales (2016), one of the most influential papers that uses historical institutions to explain different levels of trust and attitudes towards corruption is Becker et al. (2016). Using geographic RDD they show that areas once part of the Habsburg Empire have higher levels of trust in institutions and lower levels of corruption than in nearby areas that were under the Ottoman rule. Regarding the effect of the history of violence on modern-day outcomes, Nunn and Wantchekon (2011) find that levels of trust are reduced in areas of Africa that were historically affected by the slave trade while controlling for a number of observable factors. Jancec (2014) studies conflict in South East Europe and finds that trust is lower in

countries that were exposed to more frequent authority changes in the historical time span of 500 years.

3 HISTORICAL BACKGROUND ON THE MILITARY FRONTIER

Rothenberg (1960) writes that the Military Frontier existed for over 350 years, since the longest lasting Frontier on the south of Croatia was established in 1522 and disbanded in 1881. In the 18th and 19th centuries the Frontier was divided into nine districts: the longest-living Croatian and Slavonian Military Frontier districts situated in modern-day Croatia (1522–1881), and eight provisional districts in other countries: the Danube, Tisa, Mureş and Sava Frontiers (1702–1751), the Banat Military Frontier (1751–1873), the Transylvanian Military Frontier (1762–1851), and the Šajkaš Battalion (1763–1873). According to s.n. (1829) the population of the Military Frontier in 1828 was 1,073,680, while Roksandić (1988) reports every 15th inhabitant was a soldier. Ethnically, the settlers were divided almost equally into indigenous Croats, dominantly Catholic, and refugees, primarily Orthodox Serbs who were granted royal privileges to populate the Habsburg Military Frontier and serve in the war against the Ottomans.

Inside the Austro-Hungarian Empire, the settlers of the Military Frontier, the so-called *Grenzer* (German) or *Graničari* (Croatian) enjoyed privileges in the form of land allotments and were free of serfdom in exchange for permanent military service and loyalty to the Austrian Habsburg crown, instead of the Hungarian-Croatian one that ruled the rest of Croatia. The Frontier was established to defend aristocratic possessions of Inner-Austria and eventually to halt Ottoman armies intruding further into the Habsburg Empire. Rothenberg (1964) argues that the institution of the Military Frontier was a military establishment and an agricultural economy with barely any crafts or trade. He continues to explain the longevity of the Frontier not only by persistent Ottoman threats but also because the military status of the *Grenzer* was preferred to the manorial obligations in the civil part of the Empire. Eventually, the decline of the Ottoman Empire together with rising nationalistic aspirations and the abolition of serfdom in the 19th century eroded the leverage of imperial policy in the Frontier area and led to the final dissolution in 1881.

The life in the Military Frontier is explained in Roksandić (1988) who describes the society as being founded on a system of cooperative (or communal) families that provided soldiers from the pool of grown men, while women engaged in agriculture, child and senior care as well as all remaining communal duties. Due to the elongation of the territory that spanned from the Adriatic sea all the way to the Carpathian mountains and a 1,800 km long border with the Habsburg Empire (see Figure 1), the Frontier never developed into a coherent social and economic area. Moreover, the borders to the Habsburgs were not natural geographic areas, nor did they come from historical borders, making most important social and geographic characteristics very similar on both sides of the border (Roksandić, 1988). On the other side, the Frontier bordered with the Ottoman Empire, and in most cases social and geographical characteristics significantly differed on both sides of that border.

According to Amstadt (1969), the Frontier was super-institutionalized and super-bureaucratized, and under constant pressures for reforms, the need for which partially stemmed from the bureaucracy itself. Becker et al. (2016) showed that the Habsburg institutions established in the long-gone Habsburg Empire – even in areas very far from Vienna – survived both World Wars, the socialist system, transition, and persist to this day. Although the Military Frontier established institutions, civic capital (culture), and identity different from the rest of the Empire, the demonstrated efficacy of the Habsburg administration does not give reason to doubt its effectiveness in establishing military colonialism. As Habsburg civic institutions (Becker et al., 2016), religion (Boeckh, 2013), and nationalism (Sanford, 1992), survived the twentieth century, it is plausible to assume that the heritage of military colonialism, i.e. the Military Frontier survived as well.

FIGURE 1
Military Frontier in 1800



Source: *The World of the Habsburgs* (1800).

4 DATA, IDENTIFICATION, AND METHODOLOGY

4.1 DATA

In order to analyze the long-run persistence of the Military Frontier in modern-day institutions, we use all three waves of the LiTS collected by the European Bank for Reconstruction and Development (EBRD) in 2006, 2010, and in 2016. LiTS records attitudes, opinions and values in post-transition countries. In particular, the first wave (2006) assessed public attitudes, well-being and the impact of economic and political change; the second wave (2010) dealt mostly with the effects of the financial crisis; while the last wave from 2016 explored life satisfaction, corruption, and gender gaps in the labor market and business. The covariates in LiTS are observed at the individual level and they include information on the respondents' age, gender, education, religion, labor market status, household size, number of children under age 14, and – most importantly – location of residence. Figure 2 displays the location of respondents in the three LiTS waves differentiating them by colors. The shaded area represents the former Military Frontier. We

restrict the analysis to modern-day Croatia because the Croatian and Slavonian districts represent the longest-lasting Military Frontier, persisting for 359 years. The part of the Slavonian district in the far east (Eastern Symium) is left out from the analysis because the area came under the territory of the Socialist Republic of Serbia in 1945. For each location in our dataset, we provide corresponding geographic longitudes and latitudes together with information on affiliation with the Military Frontier using Regan and Kaniški (2003). A geographic information system (GIS) is used to geocode location data in order to compute distances between locations and distances to the Military Frontier border, enabling us to take different subsamples of respondents around a specified distance from the border.

As in Becker et al. (2016) we use corruption and trust in public institutions as our main outcomes of interest. In all three LiTS waves, the question on trust in public institutions in the survey is unchanged and reads: 'To what extent do you trust the following institutions?' with courts and police among the offered institutions. The answer categories span from 'complete distrust' to 'complete trust', with 'some distrust', 'neither trust nor distrust', and 'some trust' in between. We exclude a small number of observations that provide no answer, or where the answer is 'difficult to say'. Regarding corruption, the question of interest is 'In your opinion, how often is it necessary for people like you to have to make unofficial payments/gifts in these situations?' where both courts and traffic police are included as possible situations. The answers proposed are: 'never', 'seldom', 'sometimes', 'usually', and 'always'. For our falsification test we use a proxy for social capital, constructed as a dummy variable for political party membership and voluntary organization or club membership.

FIGURE 2*Military Frontier 1868–1881 and the LiTS locations*

Notes: Military Frontier in modern-day Croatia before its dissolution in 1881. We are grateful to Tomislav Kaniški from Leksikografski zavod Miroslav Krleža who provided us with Military Frontier 1868–1881 shapefiles from Regan and Kaniški (2003). LiTS wave 2006 is presented by the red color, the 2010 wave with yellow, and the 2016 wave with the blue color.

Columns (1)–(4) in Table 1 report descriptive statistics of our individual-level covariates. There are 13.9% respondents that live in the territory of the former Military Frontier. The average age of all respondents is slightly above 50 years, there are 59% men, most of the respondents have secondary education, and are Christian. They live in small households (mean household size is 1.8) with the mean number of children under 14 equal to 1.4. Somewhat above 70% of the households in which they live own a car, a bank account, and has a debit or a credit card, while 86% own a mobile phone. Slightly above half of households own a computer and have access to internet at home.

4.2 IDENTIFICATION AND METHODOLOGY

Columns (5)–(8) in Table 1 report descriptive statistics for Military Frontier and non-Military Frontier separately. In terms of age, gender, education, religion, household size and number of children under 14 there are hardly any differences

between the two subsamples. However, there are significant differences in terms of respondents working for income during the last 12 months, and all six household-level variables that reflect economic status. Presumably, the indicators are worse for the former Military Frontier, so we include them as controls in our analysis. These simple descriptive statistics show that the areas of the former Military Frontier are poorer and have higher unemployment rates and worse other economic performance indicators.

Our basic model estimates the effect of an individual living in a location that was once under the Habsburg Military Frontier on his/her measures of trust and corruption. We estimate the following equation:

$$outcome_{ilw} = \alpha + \beta military_frontier_{ilw} + X'_{ilw}\gamma + \varphi_w + \epsilon_{ilw}$$

where i is an individual living in location l in a specific LiTS wave w , $military_frontier_{ilw}$ is an indicator that takes the value 1 if a location was a part of the Military Frontier and 0 otherwise, X'_{ilw} is a set of individual and household-level control variables, and φ_w are LiTS wave fixed effects. We first estimate the model using all observations from the three waves in Croatia (Table 2), and then continue with border specifications – sample restricted to respondents living within 200 kilometers from the former Military Frontier border (Tables 3 to 7). In our robustness analysis we further restrict the samples, down to 25 kilometers around the border. In Table 7 we test the validity of our model by using different outcomes – such as trust in other people, and in private entities, and also social capital presented by membership in political parties – where we find that our falsification tests hold. We estimate ordered logit models since the responses are categorical variables, assuming a constant odds ratio.

We also propose the use of a geographic RDD approach. Following Dell (2010), we view institutions implemented in the Military Frontier as a deterministic and discontinuous function of geographic position, i.e. longitude and latitude. In other words, using the historical borders of the Frontier we are able to estimate the effect using the geographic RDD approach. While RDDs are a widely popular identification strategy in economics (Thistlethwaite and Campbell, 1960; Lee and Lemieux, 2010), geographic RDD differs from the simple setup as the forcing variable is two-dimensional since location is uniquely determined by both longitude and latitude. Therefore, the identification assumptions are identical – all other covariates must be constant across the Military Frontier border – but the estimation is slightly altered. In particular, we estimate:

$$outcome_{ilw} = \alpha + \beta military_frontier_{ilw} + X'_{ilw}\gamma + f(\text{geographic location}_l) + \varphi_w + \epsilon_{ilw}$$

where $outcome_{ilw}$ is a realization of the outcome variable for an individual i in location l for a LiTS wave w , and $military_frontier_{ilw}$ is an indicator that takes the value 1 if a location was a part of the Military Frontier and 0 otherwise. X'_{ilw}

TABLE 1
Descriptive statistics

	Both sides			Military Frontier		Non-Military Frontier		
	Mean (1)	SD (2)	Min (3)	Max (4)	Mean (5)	SD (6)	Mean (7)	SD (8)
Part of Military Frontier	0.139	0.346	0	1	1.000	0.000	0.000	0.000
<i>Individual-level variables</i>								
Age of respondent	50.299	17.613	18	95	52.420	17.534	49.957	17.605
Male respondent	0.587	0.492	0	1	0.619	0.486	0.582	0.493
Worked for income during last 12 months	0.479	0.500	0	1	0.360	0.481	0.498	0.500
Education (omitted category: no degree)								
Compulsory schooling education	0.147	0.355	0	1	0.195	0.396	0.140	0.347
Secondary education	0.456	0.498	0	1	0.410	0.492	0.464	0.499
Professional, vocational school or training	0.170	0.375	0	1	0.159	0.366	0.171	0.377
Higher professional degree (university, college)	0.136	0.343	0	1	0.083	0.276	0.145	0.352
Post-graduate degree	0.026	0.159	0	1	0.021	0.143	0.027	0.161
Religion (omitted category: atheist)								
Buddhist	0.001	0.024	0	1	0.000	0.000	0.001	0.026
Jewish	0.001	0.024	0	1	0.000	0.000	0.001	0.026
Christian	0.900	0.300	0	1	0.928	0.260	0.895	0.306
Muslim	0.012	0.109	0	1	0.031	0.174	0.009	0.095
Other	0.007	0.085	0	1	0.004	0.064	0.008	0.087
<i>Household-level variables</i>								
Household has a car	0.713	0.452	0	1	0.609	0.489	0.730	0.444
Household has a bank account	0.713	0.452	0	1	0.654	0.476	0.723	0.448
Household has a credit/debit card	0.750	0.433	0	1	0.587	0.493	0.782	0.413
Household has a mobile phone	0.856	0.351	0	1	0.739	0.440	0.875	0.330
Household has a computer	0.584	0.493	0	1	0.437	0.497	0.608	0.488
Household has access to internet at home	0.558	0.497	0	1	0.420	0.494	0.581	0.494
Household size (equivalent scale)	1.755	0.624	1.000	4.500	1.774	0.656	1.752	0.619
Household number of children under 14	1.353	0.757	1	7	1.416	0.809	1.343	0.748

Source: *Life in Transition Survey (LiTS) 2006, 2010 and 2016; see main text for details.*

denotes individual and household-level covariates, φ_w is a set of LiTS wave fixed effects, while $outcome_{ihw}$ denotes a flexible (polynomial) function of geographic location – either longitude and latitude or distance to border. In order to pinpoint our effect, we propose varying distances to border, bandwidths, starting with 200 kilometers from both sides of the border and narrowing down to 25 kilometers.

5 RESULTS

In the first part of our analysis we estimate the model on the whole sample of households in Croatia. Table 2 uses 3,361 observations from 164 different primary sampling units (PSU) or places of residence collected from the three LiTS waves. The four models presented control for respondents' age, gender, and religious affiliation.¹ Our results show that living in a location that was once part of the Military Frontier is positively associated with higher trust in courts and police. Interestingly, when we control for the fact that the respondent actually interacted with the court or with the traffic police in the last 12 months, we find a statistically significant, strong, and positive relationship between living on former Military Frontier territory and unofficial payments/gifts – bribes – made to courts and to the traffic police. In other words, respondents seem to have a higher level of trust in public authorities, but also tend to bribe those institutions more often when they interact with them. Similarly, Becker et al. (2016) found that living in ex-Habsburg territory increases trust in courts and police, but they found an opposite effect for bribery, that it decreases the intensity of bribery. The Military Frontier is therefore somewhere in between the institution-friendly Habsburg Empire and the bribery-friendly manifestation of persistent economic under-development east of the civil part of Croatia, in this case possibly even confounded by the presence of Ottomans (for details on the relationship between corruption, socialism, and the Ottomans see Uberti, 2018).

5.1 BORDER SPECIFICATION

In order to make our treatment and control groups more comparable, we continue by restricting our sample to the border specification of respondents living within 200 kilometers from the border. This slightly shrinks the total number of observations, while the number of locations by which we cluster falls from 164 to 159, preserving most of the statistical power. According to Table 3 the effects found persist, and remain robust. In three cases the point estimate is slightly lower suggesting that there still might be unobserved location differences present. Regarding the size of the estimated effects, marginal effects presented in Table A1 of the Appendix suggest that when holding other variables at their means, living on the former Military Frontier territory increases the probability of moving to a higher

¹ Although minority status is an important determinant, the question from the first LiTS 'Do you consider yourself as a member of an ethnic minority in this country?', is not repeated in the two subsequent waves. Based on a question from the third wave 'What is your ethnicity?' we were able to construct a minority dummy and repeat our analysis for the first and third LiTS waves only. These results are available on request and they suggest that the results on all three LiTS waves are robust. The minority dummy is significant in a small number of cases and the sign and size of all other coefficients remains unchanged. The only change is in the statistical significance of our Military Frontier variable that goes down in some cases with trust as the outcome variable. We believe this is due to small sample size that reduces statistical power.

category of trust in courts by 3.8 percentage points, on average across the five categories. For the remaining measures, the average marginal effects are equal to 2.8 percentage points for the trust in police, 6.8 percentage points for bribes to courts, and 4.2 percentage points for bribes to the traffic police. As there are five answer categories, their average share amounts up to 20% suggesting that the Military Frontier moves the public institutions categories by 14–34% on average. The marginal effects for Military Frontier affiliation are large in comparison to respondents’ age and gender, although they are somewhat smaller than some religion types.

TABLE 2
Trust and corruption in courts and police

	Trust in		Bribes to	
	courts	police	courts	traffic police
	(1)	(2)	(3)	(4)
Part of Military Frontier	0.392** (0.189)	0.273** (0.137)	0.835*** (0.259)	0.469* (0.258)
Age of respondent	-0.001 (0.002)	0.010*** (0.002)	-0.008** (0.003)	-0.018*** (0.003)
Male respondent	-0.120* (0.064)	0.075 (0.061)	0.090 (0.099)	0.131 (0.094)
Used service in last 12 months			0.547*** (0.165)	0.644*** (0.123)
Controls for religious affiliation (6 categories)	Yes	Yes	Yes	Yes
Controls for LiTS wave	Yes	Yes	Yes	Yes
No. of observations	3,361	3,411	3,272	3,302
No. of locations	164	164	164	164
Pseudo-R ²	0.016	0.019	0.029	0.046

Notes: Coefficients and standard errors from ordered logit estimation. Dependent variable in columns (1) and (2) is answer to the question “To what extent do you trust the following institutions?” Column (1): The courts. Column (2): The police. Answer categories are: 1 = Complete distrust; 2 = Some distrust; 3 = Neither trust nor distrust; 4 = Some trust; 5 = Complete trust. Category 6 = Difficult to say/Don’t know/Not applicable/Not stated are set to missing in regressions. Dependent variable in columns (3) and (4) is answer to the question “In your opinion, how often is it necessary for people like you to have to make unofficial payments/gifts in these situations?” Column (3): Interact with the courts. Column (4): Interact with the traffic police. Answer categories are: 1 = Never; 2 = Seldom; 3 = Sometimes; 4 = Usually; 5 = Always. Category 6 = Difficult to say/Don’t know/Refusal set to missing in regressions. Standard errors clustered at the level of PSU or place of residence are in parentheses: *significance at 10, **5, ***1 percent.
Source: Life in Transition Survey (LiTS) 2006, 2010 and 2016; see main text for details.

Table A2 provides details on the marginal effects by specific answer categories. Living in former Military Frontier territory increases the probability of reporting some trust in courts by 5.1 percentage points, and decreases the probability of reporting complete distrust in courts by 7.2 percentage points. Regarding bribes to courts, Military Frontier is associated with a 16.9 percentage points lower probability of reporting the category of never having to bribe, a 7.3 percentage points higher probability of having to bribe sometimes, and a 3.6 percentage points higher probability of usually having to bribe the courts.

5.2 GEOGRAPHIC REGRESSION DISCONTINUITY DESIGN

The results of our geographic RDD are presented in Table 4 with the two-dimensional RDD in latitude and longitude in the upper panel, and the one-dimensional RDD with distance to border in the bottom panel. For the two-dimensional case we present four different specifications with either the linear, quadratic, cubic or quartic polynomial function of geographic location. The reference, linear, specification is shown in the first row and it clearly resembles the results from the border specification (Table 3). At higher orders of polynomials, a lot of statistical significance is lost – but as Gelman and Imbens (2018) suggest that controlling for polynomials of orders above two leads to noisy estimates and poor coverage of confidence intervals – we prefer the linear estimate. The one-dimensional case remains robust only for the outcomes related to bribes. The effect persists for the linear and the quadratic case, but also when we add an interaction term (distance to border multiplied with the Military Frontier dummy) to the linear case.

TABLE 3

Trust and corruption in courts and police: border specification

	Trust in		Bribes to	
	courts	police	courts	traffic police
	(1)	(2)	(3)	(4)
Part of Military Frontier	0.383** (0.188)	0.285** (0.139)	0.813*** (0.261)	0.448* (0.260)
Age of respondent	-0.001 (0.002)	0.010*** (0.002)	-0.007** (0.003)	-0.018*** (0.003)
Male respondent	-0.119* (0.066)	0.068 (0.063)	0.084 (0.010)	0.118 (0.094)
Used service in last 12 months			0.599*** (0.167)	0.652*** (0.124)
Controls for religious affiliation (6 categories)	Yes	Yes	Yes	Yes
Controls for LiTS wave	Yes	Yes	Yes	Yes
No. of observations	3,272	3,319	3,183	3,213
No. of locations	159	159	159	159
Pseudo-R ²	0.016	0.018	0.029	0.047

Notes: Coefficients and standard errors from ordered logit estimation. Border sample: respondents living within 200 km from the former Military Frontier border. Dependent variable in columns (1) and (2) is answer to the question “To what extent do you trust the following institutions?” Column (1): The courts. Column (2): The police. Answer categories are: 1 = Complete distrust; 2 = Some distrust; 3 = Neither trust nor distrust; 4 = Some trust; 5 = Complete trust. Category 6 = Difficult to say/Don’t know/Not applicable/Not stated are set to missing in regressions. Dependent variable in columns (3) and (4) is answer to the question “In your opinion, how often is it necessary for people like you to have to make unofficial payments/gifts in these situations?” Column (3): Interact with the courts. Column (4): Interact with the traffic police. Answer categories are: 1 = Never; 2 = Seldom; 3 = Sometimes; 4 = Usually; 5 = Always. Category 6 = Difficult to say/Don’t know/Refusal set to missing in regressions. Standard errors clustered at the level of PSU or place of residence are in parentheses: *significance at 10, **5, ***1 percent.

Source: Life in Transition Survey (LiTS) 2006, 2010 and 2016; see main text for details.

TABLE 4
Geographic regression discontinuity design

	Trust in		Bribes to	
	courts	police	courts	traffic police
	(1)	(2)	(3)	(4)
<i>Polynomials in latitude and longitude</i>				
Linear polynomial (reference specification)	0.329* (0.192)	0.267* (0.147)	0.869*** (0.270)	0.450* (0.253)
Quadratic polynomial in latitude and longitude	0.225 (0.232)	-0.076 (0.191)	0.902** (0.445)	0.402 (0.341)
Cubic polynomial in latitude and longitude	0.214 (0.243)	-0.077 (0.199)	0.825* (0.485)	0.287 (0.332)
Quartic polynomial in latitude and longitude	0.275 (0.311)	-0.210 (0.249)	0.697 (0.715)	0.356 (0.469)
<i>Polynomials in distance to border</i>				
Linear polynomial in distance to border	0.352 (0.244)	0.055 (0.184)	0.781** (0.371)	0.460* (0.301)
Quadratic polynomial in distance to border	-0.006 (0.052)	-0.196** (0.083)	0.773** (0.372)	0.458*** (0.146)
Interacted linear polynomial in distance to border	0.241 (0.285)	-0.021 (0.206)	0.929** (0.395)	0.711** (0.295)
No. of observations	3,272	3,319	3,183	3,213

Notes: All reported estimates are coefficients of the variable “Part of Military Frontier” in a model specification that includes all control variables shown in Table 3. Coefficients and standard errors from ordered logit estimation. Border sample: respondents living within 200 km from the former Military Frontier border, based on GIS-computed distance from border. Standard errors clustered at the level of PSU or place of residence are in parentheses: *significance at 10, **5, ***1 percent.

Source: Life in Transition Survey (LiTS) 2006, 2010 and 2016; see main text for details.

5.3 ROBUSTNESS CHECKS

Although we do find statistically significant results, we subject our analysis to the bias-variance tradeoff and vary the distance to border that decides on the sample size and how close to the discontinuity – border – we run our analysis. We therefore narrow the bandwidth from the initial 200 kilometers to 150, 100, 50, and finally to 25 kilometers. We perform this exercise with the approaches taken in Tables 3 and 4 (the two-dimensional linear RDD), results of which are presented in the first rows of Table 5, i.e. for the 200 kilometer case. The point estimates appear to be rather stable when we decrease the bandwidth, and we can safely claim that the results are robust down to 50 kilometers around the border. At the narrowest band though (25 kilometers), only the result for bribes to courts holds, although the coefficients for the traffic police are statistically significant at the 10.9% and 10.3% levels.

As mentioned earlier, there are significant differences in some individual and household-level variables between the treatment and the control group. These are

presumably endogenous to the Military Frontier as they mostly reflect the economic status. In Table 6 we show the results when we include these additional control variables: working for income status, household size, number of children under 14, urbanization, and controls for household property such as owning a car, a bank account, a mobile phone, and/or a computer. Our results indicate that the results are arguably very stable; the variance does increase a bit, and the point estimates are somewhat smaller for the trust outcomes, and larger for the bribes outcomes. It is therefore safe to assume that none of the controls included could be a convincing alternative channel of the military colonialism effect.

5.4 MILITARY COLONIALISM, INTERPERSONAL TRUST AND SOCIAL CAPITAL

Finally, we run the analysis on interpersonal trust and trust in private entities, instead of trust in public services, to corroborate that the effect is coming from the public institutions and not from some pre-existing social life of the region. The Military Frontier in its approach did not interfere with the existing way of living, but channeled its power through newly-built institutions. We find that the affiliation with the Military Frontier has a statistically significant negative effect on interpersonal trust (column (1) of Table 7), while the point estimate for the trust in trade unions is also negative. Becker et al. (2016) for example did not find a statistically significant effect for interpersonal trust, so it leads us to believe that the Military Frontier, as an extreme institution-building case study, did not only instill trust in its own public institutions, but that it negatively affected trust between people. The results in this paper reflect on historical intuition and on Greif (1994) that the population of the Military Frontier had good reason to trust Vienna as it protected them from local governments, feudal lords from the civil part of Croatia, and most importantly, from paying taxes. Meanwhile, the people that migrated to the Military Frontier from the East brought with them the culture of the East and Ottomans as well. And since the Ottoman Empire, unlike the Habsburg Empire, was not ruled by law (Uberti, 2018), it is not that surprising that bribery persisted. Also, the ethnic population mix laid the ground for higher trust in extended families and lower trust across different ethnic groups.

TABLE 5
Different bandwidths around Military Frontier border

	Trust in		Bribes to		No. of	
	courts	police	courts	traffic police	observations	clusters
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Border specification (as in Table 3) (distance from border in km)</i>						
<200	0.383** (0.188)	0.285** (0.139)	0.813*** (0.261)	0.448* (0.260)	3,272	159
<150	0.403** (0.188)	0.289** (0.139)	0.830*** (0.263)	0.469* (0.261)	3,232	157
<100	0.367* (0.188)	0.268* (0.141)	0.825*** (0.264)	0.449* (0.265)	3,054	148
<50	0.401** (0.195)	0.213 (0.150)	0.850*** (0.279)	0.451* (0.268)	2,178	105
<25	0.131 (0.243)	0.117 (0.183)	0.735* (0.394)	0.527 (0.329)	967	51
<i>RDD specification with linear polynomial in latitude and longitude (as in Table 4) (distance from border in km)</i>						
<200	0.329* (0.192)	0.267* (0.146)	0.869*** (0.270)	0.450* (0.253)	3,272	159
<150	0.356* (0.192)	0.282* (0.147)	0.895*** (0.271)	0.484* (0.253)	3,232	157
<100	0.300 (0.192)	0.257* (0.150)	0.853*** (0.276)	0.447* (0.258)	3,054	148
<50	0.227 (0.196)	0.264 (0.175)	0.813*** (0.309)	0.482* (0.261)	2,178	105
<25	0.004 (0.232)	0.015 (0.185)	0.839* (0.456)	0.605 (0.371)	967	51

*Notes: All reported estimates are coefficients of the variable "Part of Military Frontier" in a model specification that includes all control variables shown in Table 3. The number of observations and clusters reported in columns (5) and (6) refer to the average number of observations/clusters in all four model specifications. Standard errors clustered at the level of PSU or place of residence are in parentheses: *significance at 10, **5, ***1 percent.*

Source: Life in Transition Survey (LiTS) 2006, 2010 and 2016; see main text for details.

TABLE 6

Additional control variables

	Trust in		Bribes to	
	courts	police	courts	traffic police
	(1)	(2)	(3)	(4)
<i>Border specification</i>				
Part of Military Frontier	0.324* (0.185)	0.229* (0.137)	0.825*** (0.265)	0.476* (0.260)
Age of respondent	-0.004 (0.002)	0.006** (0.003)	-0.004 (0.004)	-0.014*** (0.125)
Male respondent	-0.094 (0.064)	0.045 (0.065)	0.024 (0.104)	0.046 (0.094)
Used service in last 12 months			0.589*** (0.171)	0.587*** (0.125)
Worked for income during last 12 months	-0.048 (0.077)	-0.179** (0.085)	0.198* (0.101)	0.216* (0.095)
Urban area	0.089 (0.121)	-0.043 (0.112)	0.110 (0.225)	-0.004 (0.194)
Household size (equivalent scale)	0.036 (0.079)	0.173** (0.077)	0.195* (0.114)	0.094 (0.101)
Household number of children under 14	0.116** (0.055)	0.059 (0.052)	-0.097 (0.074)	-0.038 (0.073)
Controls for religious affiliation (6 categories)	Yes	Yes	Yes	Yes
Controls for LiTS wave	Yes	Yes	Yes	Yes
Controls for household property (4 variables)	Yes	Yes	Yes	Yes
Controls for education level (6 categories)	Yes	Yes	Yes	Yes
No. of observations	3,272	3,319	3,183	3,213
No. of locations	159	159	159	159
Pseudo-R ²	0.020	0.022	0.033	0.051
<i>RDD specification with linear polynomial in latitude and longitude</i>				
Part of Military Frontier	0.280 (0.188)	0.220 (0.143)	0.880*** (0.274)	0.474* (0.254)
Controls (as above)	Yes	Yes	Yes	Yes

Notes: Coefficients and standard errors from ordered logit estimation. Sample: respondents living within 200 km from the former Military Frontier border, based on GIS-computed distance from border. Dependent variable in columns (1) and (2) is answer to the question "To what extent do you trust the following institutions?" Column (1): The courts. Column (2): The police. Answer categories are: 1 = Complete distrust; 2 = Some distrust; 3 = Neither trust nor distrust; 4 = Some trust; 5 = Complete trust. Category 6 = Difficult to say/Don't know/Not applicable/Not stated are set to missing in regressions. Dependent variable in columns (3) and (4) is answer to the question "In your opinion, how often is it necessary for people like you to have to make unofficial payments/gifts in these situations?" Column (3): Interact with the courts. Column (4): Interact with the traffic police. Answer categories are: 1 = Never; 2 = Seldom; 3 = Sometimes; 4 = Usually; 5 = Always. Category 6 = Difficult to say/Don't know/Refusal set to missing in regressions. Standard errors clustered at the level of PSU or place of residence are in parentheses: *significance at 10, **5, ***1 percent.

Source: Life in Transition Survey (LiTS) 2006, 2010 and 2016; see main text for details.

TABLE 7
Interpersonal trust and membership in organizations

	Trust in		Membership in	
	other people	trade unions	political parties	civic organizations
	(1)	(2)	(3)	(4)
<i>Border specification</i>				
Part of Military Frontier	-0.329* (0.185)	-0.141 (0.195)	0.016 (0.105)	0.103** (0.149)
Controls (as in Table 6)	Yes	Yes	Yes	Yes
No. of observations	3,243	3,196	3,370	3,370
No. of locations	158	159	159	159
Pseudo-R ²	0.013	0.008	0.052	0.116
<i>RDD specification with linear polynomial in latitude and longitude</i>				
Part of Military Frontier	-0.299 (0.190)	-0.126 (0.198)	0.010 (0.105)	0.105** (0.152)
Controls (as in Table 6)	Yes	Yes	Yes	Yes
No. of observations	3,243	3,196	3,370	3,370
No. of locations	158	159	159	159
Pseudo-R ²	0.015	0.009	0.059	0.118

Notes: Columns (1) and (2): Coefficients and standard errors from ordered logit estimation. Columns (3) and (4): marginal effects and standard errors from probit estimations. Sample: respondents living within 200 km from the former Military Frontier border, based on GIS-computed distance from border. Dependent variable in columns (1) and (2) is answer to the question “To what extent do you trust the following [...]?” Column (1): Other people. Column (2): Trade unions. Answer categories are: 1 = Complete distrust; 2 = Some distrust; 3 = Neither trust nor distrust; 4 = Some trust; 5 = Complete trust. Category 6 = Difficult to say/Don’t know/Not applicable/Not stated are set to missing in regressions. Dependent variable in columns (3) is answer to the question “Are you a member of a political party?”. Dependent variable in columns (4) is answer to the question “Are you a member of (other) civic/voluntary organizations?”. Standard errors clustered at the level of PSU or place of residence are in parentheses: *significance at 10, **5, ***1 percent.

Source: Life in Transition Survey (LiTS) 2006, 2010 and 2016; see main text for details.

Banerjee and Iyer (2005) and Iyer (2010) for example found that British colonialism in India had long-term adverse impacts on the social structure of affected areas, in the sense that they are now less able to exert their influence on policy makers to obtain an appropriate amount of expenditure on public goods. Spanish forced labor systems in Peru have a persistent negative effect on modern household consumption, most probably also due to lower access to education, health and public goods (Dell, 2010). It seems that the Habsburg Military Frontier due to its authoritarian centralized system was efficient in installing institutions, but due to its militaristic nature, not particularly interested or successful in caring for the social and economic fabric of the *Grenzer* society.

As a different falsification test, we also use proxies for social capital as our outcomes. Regarding membership in political parties (column (3) of Table 7), we find no statistically significant effect, but there is a small positive effect on membership

in civic organizations. The latter could possibly be explained by the typical life in communities that persisted in the Military Frontier territory much longer than in the rest of Croatia, but further research is needed to confirm this hypothesis.

6 WAR IN YUGOSLAVIA

In this section we recognize that there is possibly a confounding element and a potential channel in our analysis and explore if our results hold if we take into account this endogenous shock. Due to the massive east-to-west migrations induced by the Ottoman conquests, the ethnic composition on the border with the Ottomans permanently changed. As a response to migration, but also due to the defense strategies of Austrian noblemen, Vienna organized a military cordon on the eastern and south eastern borders of Croatia. It used the influx of mostly Serbian refugees to create a migration policy that consisted of the following. The area was to be populated by refugees that would be granted certain rights together with institutionalized ethnic and religion tolerance in the area of the Military Frontier in exchange for military obligations. The settlers were given land and they were freed from manorial obligations – serfdom – as opposed to the civil part of the Empire. The special status persisted until the dissolution of the Frontier in 1881 when its territory (and population) was unified with Croatia. A hundred years later, one could still observe that the ethnic composition from the 19th century was geographically preserved with relatively more Serbs living in the former Military Frontier area. With the collapse of socialist systems around Europe, Croatia opted for independence from Yugoslavia in 1991, spurring the proclamation of the so-called Republic of Serbian Krajina, which covered much of the area of the former Military Frontier. During the 1990s, the area was thus under fire, military occupation, and it endured extreme human and infrastructure losses. Taking this rather recent historical episode into consideration, one has to argue that it is possibly the war in Yugoslavia that is driving our results, and not the former Military Frontier, although the Frontier was a channel that led to the violent conflict in the 1990s in the first place.

TABLE 8
Trust and corruption in courts and police

	Trust in		Bribes to	
	courts	police	courts	traffic police
	(1)	(2)	(3)	(4)
Part of Military Frontier	0.325 (0.230)	0.153 (0.139)	0.804** (0.344)	0.567 (0.348)
Age of respondent	-0.002 (0.002)	0.010*** (0.002)	-0.009*** (0.003)	-0.019*** (0.003)
Male respondent	-0.127* (0.068)	0.064 (0.067)	0.051 (0.106)	0.123 (0.100)
Used service in last 12 months			0.509*** (0.178)	0.637*** (0.130)
Controls for religious affiliation (6 categories)	Yes	Yes	Yes	Yes
Controls for LiTS wave	Yes	Yes	Yes	Yes
No. of observations	3,036	3,080	2,957	2,994
No. of locations	147	147	147	147
Pseudo-R ²	0.016	0.020	0.023	0.043

*Notes: Coefficients and standard errors from ordered logit estimation. Sample: areas behind the frontline at arrival of UN forces in 1992 are excluded. Dependent variable in columns (1) and (2) is answer to the question "To what extent do you trust the following institutions?" Column (1): The courts. Column (2): The police. Answer categories are: 1 = Complete distrust; 2 = Some distrust; 3 = Neither trust nor distrust; 4 = Some trust; 5 = Complete trust. Category 6 = Difficult to say/Don't know/Not applicable/Not stated are set to missing in regressions. Dependent variable in columns (3) and (4) is answer to the question "In your opinion, how often is it necessary for people like you to have to make unofficial payments/gifts in these situations?" Column (3): Interact with the courts. Column (4): Interact with the traffic police. Answer categories are: 1 = Never; 2 = Seldom; 3 = Sometimes; 4 = Usually; 5 = Always. Category 6 = Difficult to say/Don't know/Refusal set to missing in regressions. Standard errors clustered at the level of PSU or place of residence are in parentheses. *significance at 10, **5, ***1 percent.*

Source: Life in Transition Survey (LiTS) 2006, 2010 and 2016 and Šterc and Pokos (1993); see main text for details.

We therefore put our investigation under further scrutiny, and create two geographical subsamples. According to Šterc and Pokos (1993) we were able to identify LiTS household locations that were behind the frontline on the arrival of UN forces in 1992. The first subsample therefore excludes the areas behind the frontline on the arrival of UN forces in 1992 (Table 8); this way we completely exclude any occupied areas. The results are robust, although statistically significant only for the bribes to courts outcome. The bribes to traffic police issue is significant at the 10.3% level, and that of trust in courts at the 15.7% level. When we exclude only the area that was behind the frontline in 1992 and that used to be part of the former Military Frontier (Table 9), the results are even more convincing as both bribe outcomes become statistically significant and strongly positive. What one might conclude is that the attitudes towards bribery are more persistent as they survive even harsh wars, while trust in public institutions collapses during extreme events.

TABLE 9

Trust and corruption in courts and police

	Trust in		Bribes to	
	courts	police	courts	traffic police
	(1)	(2)	(3)	(4)
Part of Military Frontier	0.288 (0.231)	0.141 (0.142)	0.821** (0.340)	0.577* (0.343)
Age of respondent	-0.001 (0.002)	0.009*** (0.002)	-0.009*** (0.003)	-0.018*** (0.003)
Male respondent	-0.129* (0.067)	0.067 (0.064)	0.045 (0.103)	0.124 (0.095)
Used service in last 12 months			0.513*** (0.173)	0.615*** (0.126)
Controls for religious affiliation (6 categories)	Yes	Yes	Yes	Yes
Controls for LiTS wave	Yes	Yes	Yes	Yes
No. of observations	3,184	3,230	3,106	3,143
No. of locations	155	155	155	155
Pseudo-R ²	0.015	0.018	0.026	0.044

Notes: Coefficients and standard errors from ordered logit estimation. Sample: areas behind the frontline at arrival of UN forces in 1992 on the territory of former Military Frontier are excluded. Dependent variable in columns (1) and (2) is answer to the question “To what extent do you trust the following institutions?” Column (1): The courts. Column (2): The police. Answer categories are: 1 = Complete distrust; 2 = Some distrust; 3 = Neither trust nor distrust; 4 = Some trust; 5 = Complete trust. Category 6 = Difficult to say/Don’t know/Not applicable/Not stated are set to missing in regressions. Dependent variable in columns (3) and (4) is answer to the question “In your opinion, how often is it necessary for people like you to have to make unofficial payments/gifts in these situations?” Column (3): Interact with the courts. Column (4): Interact with the traffic police. Answer categories are: 1 = Never; 2 = Seldom; 3 = Sometimes; 4 = Usually; 5 = Always. Category 6 = Difficult to say/Don’t know/Refusal set to missing in regressions. Standard errors clustered at the level of PSU or place of residence are in parentheses: *significance at 10, **, ***1 percent.

Source: Life in Transition Survey (LiTS) 2006, 2010 and 2016 and Šterc and Pokos (1993); see main text for details.

7 CONCLUSIONS

The goal of this research was to use a natural experiment in macroeconomics to identify a causal mechanism of a specific political system on modern-day civic capital in order to reveal some of the fundamental causes of growth. This is the first such research done for Croatia, as it goes beyond simple mechanics of growth and provides evidence that history matters and that institutions are persistent and have far-reaching impacts. The standard to achieve this goal in modern macroeconomics is to use natural experiments and pair them with methods borrowed from microeconomics. The literature so far has offered that growth is causally related with institutions, social structure, and civic capital, both between and within countries.

Our identifying assumption is that the Military Frontier randomly split the country for a period of more than 350 years and established different economic and political systems on the two sides of the border. We obtain robust evidence that the

former Military Frontier area is poorer than the rest of the country, and that this finding can be attributed to lower interpersonal trust, but higher trust in public institutions and higher incidence of bribery. These effects are not only statistically significant, but also quantitatively reasonable as the Military Frontier moves the trust in public institutions categories by 14–34% on average. The limitation to our study is that it builds on past events, and therefore cannot be generalized or used for speculating about the future. However, parallels can be drawn. For example, one can argue that the role of Vienna (as the center of the Habsburg Empire) has now just been replaced by other political centers, and that modern day decisions on east-to-west migrations are once again in hands of politicians. As history teaches us, these decisions have far-reaching effects lasting for decades and centuries.

This study provides substantial insight into the functioning of the economy and explains factors that cause persistent differences in economic outcomes within Croatia. History matters, be it in the form of a military cordon, episodes of violence and war, or migration. Any reform or economic policy tool utilized without taking into account institutions, social structure and culture, will be ineffective and repeatedly replaced by another ineffective tool, because in order to change the trajectory, one must look into the underlying causes. Institutions and societies are persistent, but they also change, sometimes driven internally, and sometimes by exogenous events. Existing research teaches us that both persistence and change are equilibrium outcomes (Acemoglu, 1995), and that small steps and gradual reforms are usually not enough to move a country out of a 'bad' equilibrium. Since both policy makers and institutions are inherently endogenous, providing recommendations is naturally a complex task, one that asks for an empirically realistic theory of comparative growth based on institutions. Empirical research that explores the causal links between those endogenous elements is one step closer to building a more realistic theoretical framework for policy advice.

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No potential conflict of interest was reported by the author.

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TABLE A1
Average absolute marginal effects

	Trust in		Bribes to	
	courts	police	courts	traffic police
	(1)	(2)	(3)	(4)
Part of Military Frontier	0.038	0.028	0.068	0.042
Age of respondent	0.000	0.001	0.000	0.002
Male respondent	0.012	0.007	0.006	0.010
Atheist	0.046	0.031	0.004	0.010
Buddhist	0.092	0.190	0.008	0.054
Jewish	0.137	0.101	0.097	0.137
Muslim	0.019	0.061	0.059	0.063
Other religion	0.001	0.034	0.048	0.013
LiTS wave 2010	0.020	0.068	0.069	0.089
LiTS wave 2016	0.074	0.081	0.043	0.067
Used service in last 12 months			0.050	0.061

Notes: Average absolute marginal effects of each independent variable for model specifications presented in Table 3, holding the other variables at their mean. Dependent variable in columns (1) and (2) is answer to the question “To what extent do you trust the following institutions?” Column (1): The courts. Column (2): The police. Answer categories are: 1 = Complete distrust; 2 = Some distrust; 3 = Neither trust nor distrust; 4 = Some trust; 5 = Complete trust. Category 6 = Difficult to say/Don’t know/Not applicable/Not stated are set to missing in regressions. Dependent variable in columns (3) and (4) is answer to the question “In your opinion, how often is it necessary for people like you to have to make unofficial payments/gifts in these situations?” Column (3): Interact with the courts. Column (4): Interact with the traffic police. Answer categories are: 1 = Never; 2 = Seldom; 3 = Sometimes; 4 = Usually; 5 = Always. Category 6 = Difficult to say/Don’t know/Refusal set to missing in regressions.

Source: Life in Transition Survey (LiTS) 2006, 2010 and 2016; see main text for details

TABLE A2

Marginal effects of Military Frontier by category

	Trust in	
	courts	police
	(1)	(2)
Complete distrust	0.072	0.025
Some distrust	0.024	0.022
Neither trust nor distrust	0.038	0.023
Some trust	0.051	0.044
Complete trust	0.006	0.027
Average absolute marginal effect	0.038	0.028

	Bribes to	
	courts	traffic police
	(3)	(4)
Never	0.169	0.105
Seldom	0.053	0.024
Sometimes	0.073	0.056
Usually	0.036	0.019
Always	0.007	0.005
Average absolute marginal effect	0.068	0.042

Notes: Average absolute marginal effects of each independent variable for model specifications presented in Table 3, holding the other variables at their mean. The last row presents average absolute marginal effect across categories and is the same number as presented in Table A1. Dependent variable in columns (1) and (2) is answer to the question “To what extent do you trust the following institutions?” Column (1): The courts. Column (2): The police. Answer categories are: 1 = Complete distrust; 2 = Some distrust; 3 = Neither trust nor distrust; 4 = Some trust; 5 = Complete trust. Category 6 = Difficult to say/Don’t know/Not applicable/Not stated are set to missing in regressions. Dependent variable in columns (3) and (4) is answer to the question “In your opinion, how often is it necessary for people like you to have to make unofficial payments/gifts in these situations?” Column (3): Interact with the courts. Column (4): Interact with the traffic police. Answer categories are: 1 = Never; 2 = Seldom; 3 = Sometimes; 4 = Usually; 5 = Always. Category 6 = Difficult to say/Don’t know/Refusal set to missing in regressions.

Source: Life in Transition Survey (LiTS) 2006, 2010 and 2016; see main text for details.